SECRET

NPIC/TSSG/RED/SDB-010-70
13 February 1970

MEMORANDUM FOR: Chief, Research & Engineering Division, TSSG

THROUGH : Deputy Chief, Research & Engineering Division, TSSG

SUBJECT : MIM #4 Light Table Pre-heaters

REFERENCE : Memorandum from TSSG/ESD/TEB, 2-70, dated 30 January 1970

1. The purpose of the pre-heater circuit in the MIM #4 light table was not primarily to provide maximum luminance in the shortest time from start up. The purpose of the circuit was to provide flicker-free luminance at normal operating luminance levels in the shortest time from start up. The higher the input power to the light grid, the faster the excitation gas warms to its most efficient operating temperature and the faster the arc stabilizes. At low power input levels, however, (where most viewing is done) the gas warms very slowly and the arc requires a long time (a half-hour or so) to stabilize. The pre-heater was, therefore, incorporated to aid in bringing the gas in the light grid up to operating temperature so it would not flicker. A by product of bringing the gas up to temperature faster was that the maximum luminance could be reached sooner. The coolant system is actually detrimental to the lighting system performance at low light levels and therefore, must be compensated for by the heaters.

2. The problem of over cooling was noted in the prototype MIM #4 light table when the light was turned on at low power to "warm up" and it was found to be still flickering a half-hour later. The manufacturer suggested that the light, when just turned on, should be turned up to maximum power for a half-hour before using the table at normal viewing levels. Discussions with potential Government buyers found IEG/NPIC willing to live with the problem, but DIA objected. As a result, [redacted] added the pre-heater circuit and both DIA and NPIC bought it. It was not a RED development. 25X1

3. It might be noted that in the original configuration of the light table the pre-heater was located in a reservoir of coolant and maintained a higher average coolant temperature (with the light off) than the present configuration. Nevertheless, the present heater system performs as adequately as the prototype system with the pump operating, and it maintains the proper lamp gas operating temperature even when the lamp is turned down.

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The point that is made in the referenced memorandum with regard to the pre-heater being superfluous to attaining maximum brightness quickly is correct but without the heater system, flicker at low luminance levels could become a significant problem.

[redacted]
TSSG/RED/SDB

25X1

Distribution:
Original - Addressee
2 - TSSG/RED/SDB

25X1 NPIC/TSSG/RED/SDB [redacted] 13 Feb 70